power supply 8 for supplying high-frequency power to the substrate electrode 6 is also provided, so that ion energy that reaches the substrate 7 can be controlled. Also, an annular, groove-like plasma trap 9 shown in Figs. 1A and 1B is provided opposite to the substrate 7, making it possible to process the substrate 7 while the plasma distribution on the substrate 7 is controlled. The plasma trap 9 is provided in the counter electrode 5. Out of surfaces forming inner wall surfaces of the vacuum chamber 1 and opposing the substrate 7, an electrode portion 10 (cross hatched portion) surrounded by the plasma trap 9 has an area 0.8 time that of the substrate 7, as one example. Also, the groove width of the plasma trap 9 is 10 mm, and the groove depth of the plasma trap 9 is 15 mm, as one example. In addition, the counter electrode 5 is insulated from the vacuum chamber 1 by an insulating ring 11. As shown in Figure 1A (as well as the other Figures), the annular groove (plasma trap) 9 has a bottom face, an outer-side face closest to the side wall of the vacuum chamber 1, and an inner-side face farthest from the side wall of the vacuum chamber 1. As can be seen, the outer-side face of the annular groove 9 is located "inside" of the inner surface of the side wall of the vacuum chamber. In this regard, the terms "inside" and "outside" mean closer to, and farther from, respectively, a vertical center axis of the vacuum chamber.

C1

In the Claims:

Kindly cancel claims 1-55 without prejudice.

Kindly add the following new claims 56-79.

C2

56. A method of generating plasma within a vacuum chamber and processing a substrate placed on a substrate electrode within the vacuum chamber, the method comprising:

generating the plasma by supplying power having a frequency of 50 MHz to 3 GHz to an electrode positioned opposite the substrate while maintaining an interior of the vacuum chamber at